Environment Canada | Environnement Canada
Conservation and Protection | Conservation et Protection

A State of the Environment Fact Sheet

Bringing the Bald Eagle back to Lake Erie

Cradled high in a rustling oak tree is a nest overlooking the lush green marshes and sparkling waters of Lake Erie. In it is a single eaglet, barely five weeks old and still covered in dense, wool-like down. Its mother was not much older in 1983 when she was relocated to Long Point peninsula in an attempt to bring the Bald Eagle back to the lower Great Lakes basin. This eaglet is her first chick, the first in nearly 30 years to have hatched in this old nest tree. The pair of eagles that built the original nest died many years ago, and no young birds replaced them — until now.

Although bulky Bald Eagle nests were a conspicuous part of the landscape along the shore of Lake Erie at the end of the 18th century, no more than about 20 active nest sites were found along the entire length of Ontario's Great Lakes shore during a 1991 survey

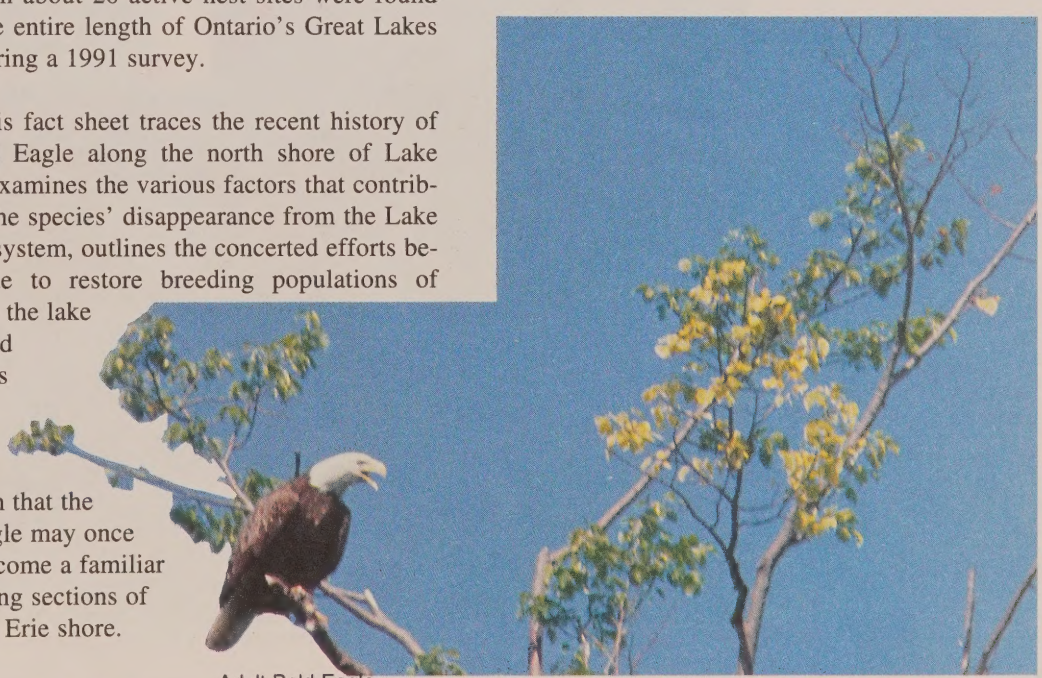
In the late 1700s, the Bald Eagle ranged across large portions of continental North America. In Ontario, it nested from the tree line south, and sizeable populations inhabited the Great Lakes basin as well as other large inland water bodies. Although bulky Bald Eagle nests were a conspicuous part of the landscape along the shore of Lake Erie at the end of the 18th century, no more than about 20 active nest sites were found along the entire length of Ontario's Great Lakes shore during a 1991 survey.

This fact sheet traces the recent history of the Bald Eagle along the north shore of Lake Erie. It examines the various factors that contributed to the species' disappearance from the Lake Erie ecosystem, outlines the concerted efforts being made to restore breeding populations of eagles to the lake basin, and illustrates why there is cautious optimism that the Bald Eagle may once again become a familiar sight along sections of the Lake Erie shore.

Appearance of the Bald Eagle

There are 59 species of eagles worldwide. Of the two that occur in North America, only the Bald Eagle is found exclusively on this continent. It is the largest bird of prey in Canada.

The scientific name for the Bald Eagle is *Haliaeetus leucocephalus*, which means "sea-eagle with a white head." North American colonists gave the species its common name at a time when "bald" (or "balled") meant white, not hairless. The adult bird is readily distinguishable by this conspicuous white head as well as by its white tail, both of which develop at about four or five years of age. In areas where the Bald Eagle still occurs, it may be seen soaring overhead on broad, steady wings, flying to and from feeding grounds or, more frequently, sitting on some exposed perch.



Adult Bald Eagle

M. Field, Hawk Cliff Raptor Banding Station

CANADA'S GREEN PLAN

The Bald Eagle has suffered greatly as a result of human activities, from the time the first European settlers arrived in North America to the present

Population changes to 1991

The Bald Eagle has suffered greatly as a result of human activities, from the time the first European settlers arrived in North America to the present. Some of the suffering was unintentional, such as the significant habitat disruptions that resulted from the logging of the large, mature trees favoured by Bald Eagles for nest sites. Much of it, however, was deliberate: eagles were traditionally viewed as pests and killers of livestock and so were exterminated by shooting, trapping, and poisoning.

Such widespread direct persecution by humans over a period of a couple of centuries took its toll on the species, and large population declines resulted. Governments were prompted to introduce legislation for the protection of Bald Eagles, and these measures were at least partly responsible for the significant recovery of the Bald Eagle between the early 1900s and about 1945, when it returned to being a relatively commonplace presence in the Great Lakes basin.

Early attitudes

In the 1800s, Bald Eagles were commonly viewed as vermin and killers of livestock and so were destroyed whenever possible. Thomas McIlwraith, an early Ontario ornithologist, referred to this attitude in his book *Birds of Ontario* (McIlwraith 1894), noting that people would

> *... often capture [eagles] by placing a poisoned carcass near the edge of the ice. The bait is sure to be taken by the first eagle that comes along and usually the bird dies before leaving the spot.*

Ernest Thompson Seton, writing on the natural history of a Toronto marsh in the 1870s, observed that

> *... there was a solitary pine at the water's edge ... that was a favourite perch with the eagles. So [a local resident] made a hide at the foot of it, and left the hide for a month or so till the birds got accustomed to it. Then before day light one day, he hid inside with his gun and waited. Before the day was over he had killed 7 eagles.*

Tom Walker, Canapress

Adult Bald Eagle, readily distinguishable by its conspicuous white head and tail and roughly two-metre wingspread

A brief life history of the Bald Eagle

The Bald Eagle becomes sexually mature at four to seven years of age and mates for as long as both partners are able to reproduce. The species returns annually to the same nesting territory; in the Lake Erie region, the breeding pairs are normally back by January. During February and March, pairs engage in courtship rituals, which include rearranging and adding to their bulky stick nest. The nest typically is in a large, mature tree, oaks and pines being the preferred species. Fresh pine boughs, soft aquatic grasses, mosses, and feathers are used to line the nest cup, into which are laid usually two, dull white eggs.

Incubation takes about 35 days and begins when the first egg is laid. The first egg to be laid generally hatches first; as a result, this chick usually receives food first and develops faster. This results in higher mortality for any chicks that hatch later, especially if food is scarce.

Eaglets remain in the nest for 10 to 12 weeks, during which time they are fed and brooded by the adult birds. After fledging, the young birds may return to the nest for up to two months to roost and feed. Immature Bald Eagles range over a wide area before nesting at four to seven years of age. However, mortality is extremely high for young eagles, so that only about one in five survives to breeding age.

Feeding and diet of the Bald Eagle

The Bald Eagle is rarely found far from water. By nature, the species is a fish-eater, but its diet also includes birds, mammals, turtles, snakes, and other vertebrates. Being an accomplished hunter, the Bald Eagle captures its own prey. However, the bird is also opportunistic and commonly gets its food through scavenging or even piracy. The Bald Eagle will feed on dying fish and any "catch" that it can rob from other birds, particularly Ospreys.

In the context of the Great Lakes basin, the Bald Eagle is at the top of the aquatic food web. Its diet includes large predator fish, such as lake trout and salmon; garpike and other smaller predator fish; brown bullheads, channel catfish, and other scavenger fish; and Herring Gulls and other aquatic birds. During winter months, the Bald Eagle will frequent ice edges, searching for dead or injured waterfowl, gulls, and even mammals as large as deer. Its seasonal movements will lead it as far north as open water and available food permit.

By the 1950s, despite seemingly healthy populations along northern inland lakes, population declines in southern Ontario indicated that the Bald Eagle was again in trouble, particularly along the shores of the lower Great Lakes. The new threat to the Bald Eagles appeared to be the widespread use of toxic chemicals. By 1980, only three pairs were found in southern Ontario along the Lake Erie shore, and these were not producing young. Although the southern Ontario Bald Eagle started a fragile repopulation in the 1980s, the eagle was still not well known along the upper Great Lakes — only seven active nest locations were found along the shores of Lake Superior and Lake Huron.

Toxic chemicals and the decline of the Bald Eagle

A few years after the Second World War, new and elusive killers began asserting their presence in the Great Lakes ecosystem. Chlorinated organic compounds, including agricultural pesticides and a variety of industrial chemicals, came into widespread use, entering the aquatic ecosystem through runoff from agricultural lands and from the dumping of industrial and municipal wastes into lakes and streams. They then infiltrated the aquatic food web and built up in the tissues of many organisms. The fish and other biota comprising the aquatic food base of the

The Bald Eagle as an indicator of ecosystem health in the Great Lakes basin

The impact that toxic chemicals have had on wildlife in the Great Lakes basin is well known. At least 11 species, including the Herring Gull, Double-crested Cormorant, and Bald Eagle, have exhibited such detrimental biological effects as eggshell thinning, embryonic mortality, deformities, and death.

Wildlife species show a wide range in sensitivity to toxic chemicals. Thus, as cleanup activities reduce the levels of toxic chemicals in the Great Lakes basin, some species become healthier sooner than others. The least sensitive species, tolerant of relatively high concentrations of contaminants, recover first. The most sensitive, affected at relatively low concentrations, recover last. Their recovery depends more on a cleanup of the entire ecosystem.

P. Hunter, Ontario Ministry of Natural Resources

Bald Eagle nest on artificial platform

The Herring Gull is probably the least sensitive of the species affected and has shown considerable recovery, in terms of eggshell thickness and reproductive success, since the early 1970s. The Double-crested Cormorant, which is usually considered to be much more sensitive than the Herring Gull to chlorinated organic compounds, has also shown remarkable recovery. These dramatic improvements have led wildlife biologists to reconsider how best to use wildlife species as indicators of changing ecological conditions. A new, more sensitive species, or perhaps a group of more sensitive species — species that are sensitive to current levels of chemical contaminants, which are generally lower than those of the early 1970s — may be preferred for monitoring further progress towards restoring the health of the Great Lakes basin ecosystem.

The Bald Eagle is one such species. It is sensitive to DDE at current levels in the ecosystem, it has been studied extensively, and there are "control" (or relatively uncontaminated) populations available for comparison. It formerly bred throughout the Great Lakes basin and now is beginning to make a comeback. Nonetheless, there have been no active nests on Lake Ontario since 1945. Also, in some areas, because of logging and other removal of large, old trees, suitable natural nesting habitats may be limited. Experimental use of nest platforms for Bald Eagles shows promise. Finally, because of its status as an endangered species in Ontario, the Bald Eagle cannot be collected and used for routine monitoring of contaminant levels; its current usefulness as an indicator species in the Great Lakes basin is therefore limited primarily to monitoring changes in reproductive success.

Which species to use as future biomonitors or bioindicators is still being evaluated by all parties concerned. Such "retooling" of monitoring systems, however, will continue to provide better, more detailed information on some of Canada's most sensitive species and the health of their ecosystems.

entire Great Lakes ecosystem had become poisoned. The fate of the Bald Eagle, in particular, appeared to be sealed.

Bald Eagles, along with other wildlife species, have a strong tendency to take up and store toxic chemicals in their tissues (bioaccumulation); as well, these chemicals tend to increase in concentration cumulatively at successively higher levels in the food web (biomagnification). As Bald Eagles may live for 20 to 25 years, they can accumulate these chemicals over a long period of time. Once in their bodies, the compounds are not easily lost, except through egg laying; consequently, adult females usually have slightly lower levels of chemical contaminants than do adult males.

For the Bald Eagle, as well as for other birds high up in the food web, the most perilous chemical contaminant was DDT (dichlorodiphenyltrichloroethane). DDT was a synthetic organic compound whose strong insecticidal properties were not determined until the mid-1900s and whose long-term side effects did not become evident until some years later. Residues of this pesticide and its breakdown products, notably DDE (dichlorodiphenyldichloroethylene), built up to significant levels in the bodies of birds, upsetting calcium levels in the females. This interfered with the normal process of eggshell formation, such that female birds produced eggs with shells that were thinner and weaker than normal. The thin eggshells broke when the birds incubated the eggs, and the embryos inside died. DDT and DDE, as well as dieldrin, PCBs (polychlorinated biphenyls), and other toxic compounds, probably also directly caused the deaths of some developing embryos and adults.

Although the breakage of thin-shelled eggs, combined with direct toxic effects upon the embryos, resulted in the reproductive failure of Bald Eagles and dramatic population declines throughout the Great Lakes basin, these declines were not obvious to casual observers. This was because the adult birds continued to make nesting attempts, even though they did not produce young. The widespread release of toxic chemicals into their habitat was therefore the final blow for Bald Eagles, adding to the losses already suffered from direct persecution and habitat degradation, and it eventually became the probable main cause of the total nest failure observed at the three remaining active nests on the Ontario side of Lake Erie in 1980.

Studies of Bald Eagles throughout North America have found that if eggs contain less than 3 parts per million (ppm) of DDE and 4.5 ppm of PCBs, then slightly less than one young per pair is produced, on average. About one young per occupied territory is considered normal. However, if DDE levels exceed 5.1 ppm, reproduction decreases dramatically, and there is generally complete failure at levels greater than 15 ppm. As well, eggs with more than 33 ppm of PCBs produce less than one young per five pairs. Figure 1 shows that in the 1970s and 1980, Bald Eagle eggs from the north shore of Lake Erie contained DDE at concentrations that exceeded 15 ppm, as well as PCBs at levels that greatly exceeded 33 ppm, thus helping to explain why production was so low. By 1989, however, measured concentrations of DDE and dieldrin in a small sample of eggs had decreased by more than one-half, and concentrations of PCBs had decreased by as much as four-fifths. Although DDE levels in Lake Erie Bald Eagle eggs were still high enough to affect reproduction significantly, total failure did not occur. Because the pattern of declining contaminant levels is expected to continue throughout the 1990s, DDE levels in Bald Eagle eggs should eventually fall below 3 ppm, with an anticipated return to "normal" productivity.

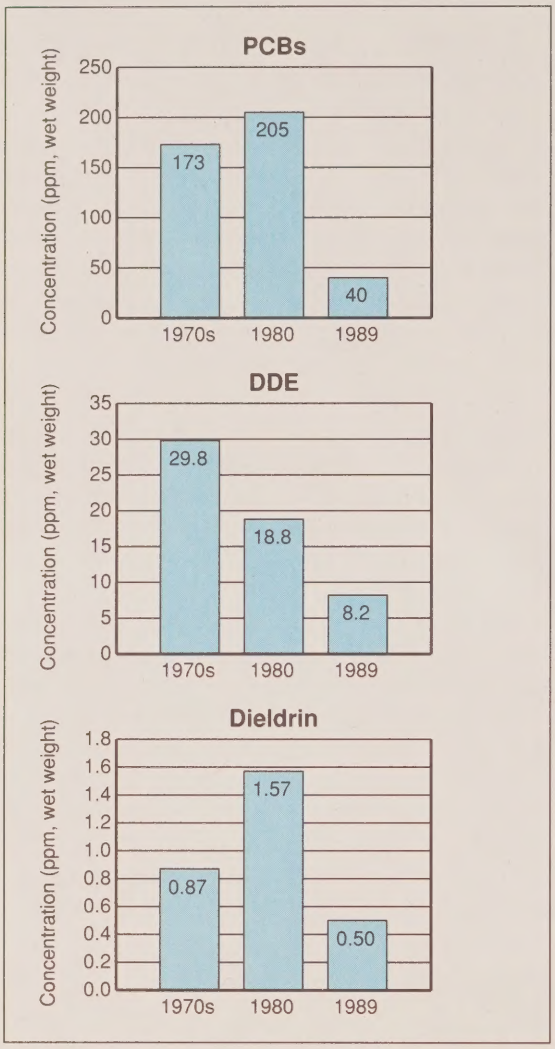
By 1989, measured concentrations of DDE and dieldrin in a small sample of eggs had decreased by more than one-half, and concentrations of PCBs had decreased by as much as four-fifths

L. Spicer, St. Thomas Field Naturalists

Adult Bald Eagle with fish

The widespread release of toxic chemicals into their habitat was the final blow for Bald Eagles, adding to the losses already suffered from direct persecution and habitat degradation

Figure 1
Concentrations of chemicals in eggs of Bald Eagles from the north shore of Lake Erie in the 1970s and 1980s



Source: Ontario Ministry of Natural Resources.

Notes:

1. Because the Bald Eagle is officially recognized as an endangered species in Ontario, it is not feasible to collect eggs and birds for routine monitoring of contaminant levels. Occasionally, eggs that fail to hatch are recovered for residue analysis; it is from these eggs that evidence has been compiled linking organochlorine chemicals with reproductive failure and population declines.

2. Data for the 1970s are from three eggs collected from two nests in Essex County (1970 and 1976) and a nest in Elgin County in 1974. The 1980 data are from three eggs from three nests in Essex County, and the 1989 data are from two eggs, one from Essex County and one from the Regional Municipality of Haldimand–Norfolk.

Reestablishing Bald Eagle populations

By the 1970s, the Bald Eagle had been eliminated from much of its former territory, particularly in eastern Canada, as a result of the widespread use of toxic chemicals, habitat destruction, and direct persecution. In 1973, Ontario became the first province to officially recognize the Bald Eagle as an endangered species. Ontario's *Endangered Species Act* gave it legal protection, establishing a system of fines or imprisonment for contraventions of the act. By the 1980s, however, it had become obvious that this protection alone was inadequate to save the Bald Eagle in southern Ontario. Without active intervention, the species eventually would cease to exist in the lower Great Lakes basin.

Without active intervention, the species eventually would cease to exist in the lower Great Lakes basin

The Bald Eagle Release Program at Long Point

In 1983, the Canadian Wildlife Service and the Ontario Ministry of Natural Resources initiated a five-year reintroduction program to enhance the Lake Erie Bald Eagle population. Long Point peninsula, once home to several pairs of nesting Bald Eagles and a final stronghold for the species in southern Ontario, extends 32 km east into Lake Erie (Figure 2). It was selected as the site for the program after a pair of breeding Bald Eagles and several inactive nests were discovered there in 1982. This demonstrated the area's suitability for nesting eagles and its potential for providing for additional breeding pairs. Indeed, historical records of nine previous nesting sites supported the notion that the area could sustain a much larger Bald Eagle population than was present in 1982.

The eastern half of Long Point is a National Wildlife Area, and much of the western half is privately owned. Limited public access thus reduces the risk of human disturbance to young eagles. Long Point is a sandspit/wetland complex with stands of mature oak–maple forest, extensive marshes, and ponds. Excellent warm-water fish habitat affords a ready supply of food for fish-eating birds.

The five-year reintroduction program involved the transfer of flightless eaglets to Long Point from an area with a healthy breeding popu-

The five-year reintroduction program involved the transfer of flightless eaglets to Long Point from an area with a healthy breeding population

Figure 2
Lake Erie and the Long Point reintroduction location

lation. The particular technique used, known as "hacking," was modelled after one developed by the New York Department of Environmental Conservation. It entailed raising the flightless young in artificial nest enclosures in an elevated tower until they were capable of sustained flight. They were then released and their activities monitored for two to four weeks.

The Lake of the Woods area of northwestern Ontario remains home to a large, natural population of Bald Eagles. Although these birds were affected by DDT, they quickly recovered after the ban on its use in the early 1970s, and so the area was deemed to be suitable as the source of the eaglets for the reintroduction program. Each year from 1983 to 1987, one eaglet was removed from each of four to six nests containing two or three young birds. Different nests were used each year to maximize genetic diversity, and an even ratio of males to females was selected. These eaglets, aged five to six weeks, were independent enough to tear their food and regulate their body temperatures without extensive parental care. After banding the birds, ensuring that they were in good health, and taking care to minimize stress to them, the investigators transported the eaglets to the Long Point National Wildlife Area. The entire capture–transfer procedure never exceeded 35 hours, and the condition of the eaglets was monitored regularly throughout.

Over the five years of the program, 28 eaglets were transferred to Long Point. Once there, the eaglets were placed in the nesting compartments of the hacking tower, which was built on a high ridge of deciduous trees overlooking an extensive marshland. In a companion project, four more eaglets were released at the Taquanyah Nature Centre on the Grand River, about 75 km northeast of Long Point, near Cayuga, Ontario.

Table 1
Number of Bald Eagle nest sites and young raised on the north shore of Lake Erie, 1980–1992

Parameter	Year												
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Number of nests	3	4	5	5	6	7	7	7	8	8	9	10	9
Number of naturally raised young	0	1	5	5	7	6	6	6	10	7	11	11	14
Number of young hacked	0	0	0	6	4	6	8	8	0	0	0	0	0
Total number of young (natural plus hacked)	0	**1**	**5**	**11**	**11**	**12**	**14**	**14**	**10**	**7**	**11**	**11**	**14**

Source: Ontario Ministry of Natural Resources; Environment Canada, Canadian Wildlife Service.

By 14 to 15 weeks of age, the eaglets' flight feathers were fully developed, and the eaglets were ready to be released. A few of the 28 eaglets flew from the compartments as soon as the doors were opened, and most of the rest made their initial flight within the first four hours. Throughout the program, no injuries or deaths occurred during release.

About one in three hacked birds reached maturity (five years of age), compared to only one in five naturally raised birds

After release, the young birds were followed, their condition was monitored, and fish and deer carcasses were put out as food for them, both on the hacking tower and along the shore. Gradually, the tower feedings were discontinued, encouraging the eaglets to fend for themselves. About one in three hacked birds reached maturity (five years of age), compared to only one in five naturally raised birds. The lower mortality of hacked birds is probably related to the fact that the birds were fed and closely monitored for up to six weeks following their release. Table 1 provides evidence of the positive influence of the hacking program on the total number of young eagles raised on Long Point and at the Taquanyah Nature Centre.

The reintroduction program received widespread media attention and public support. Elsa Wild Animal Appeal of Canada, the Ivy Fund, and other nonprofit organizations provided financial support, and Air Canada transported the eaglets.

J. Robinson, Canadian Wildlife Service

Hacking tower

The Bald Eagle Rehabilitation Project

The Ontario Ministry of Natural Resources builds on the Bald Eagle Release Program at Long Point with a rehabilitation project through its Community Wildlife Involvement Program. Many volunteers now collaborate to monitor the status and success of all known Bald Eagle nests along the north shore of Lake Erie. The value of such monitoring was exemplified in August 1990, when a windstorm broke off the top of a nest tree, bringing a nest to the ground. In anticipation of just such an event, the Ontario Ministry of Natural Resources and the landowners had placed an artificial nesting platform in a suitable adjacent tree. Within a month of the nest blowdown, the eagles had begun nest construction on the platform. By the following spring, the new nest had been completed. This is but one example of the many ways in which humans are able to help Bald Eagles return to the Great Lakes basin.

Present status

The programs described above have helped bring Bald Eagles back to Lake Erie. However, more is needed to ensure their survival. To this end, a number of recent activities have been undertaken with the aim of protecting the Bald Eagle and other endangered species as well as cleaning up the Great Lakes ecosystem, including the following:

- Scientific investigations have greatly improved understanding of the Bald Eagle's life history and of the linkages between human activities and the factors determining its survival.

- Laws have been passed that are helping to manage pollution in the Great Lakes ecosystem, especially those controlling the inputs to fresh waters of contaminants that are toxic to Bald Eagles and other biota.

- Endangered species acts of Ontario and the United States are providing legislative protection to the Bald Eagle, as well as to other species at risk.

- Strong partnerships and collaborations have been forged — between governments, a diverse range of nongovernmental agencies, the corporate sector, and individuals — for the purposes of species and habitat enhancement.

- Education programs have enhanced appreciation of and expectations for the Bald Eagle and other components of Canada's, and North America's, native biodiversity.

These accomplishments are resulting in a healthier ecosystem for the Bald Eagle as well as for all other biota inhabiting the Great Lakes basin.

The Canadian side of Lake Erie

The Bald Eagle is back at Long Point. In some areas, birds can be seen almost daily — as many as 11 were seen on one winter day in 1986. Of the 32 birds hacked between 1983 and 1987 at Long Point and at the Taquanyah Nature Centre, five are known to have died, and none has been observed nesting — possibly because the birds lost the distinctive wing markers that were applied to them as eaglets, making them virtually indistinguishable from other banded eagles. Nonetheless, sightings and nesting of Bald Eagles on the Lake Erie shore continue to increase. By 1992, there were at least four pairs of eagles at Long Point, with three pairs nesting successfully to produce five young. Elsewhere on the Ontario shore of Lake Erie, particularly the western end of the lake, seven pairs produced nine young. In 1993, hacked birds nested at Turkey Point, and Owen Sound, on Georgian Bay.

A number of factors have contributed to the fragile repopulation of the Bald Eagle on Lake Erie. Reduced levels of chemical contaminants allow a greater chance of survival of eagles than at any time in the last 30 years. The hacking programs have helped to increase the number of breeding-age birds in the region. Also, more young birds are being produced in the upper Great Lakes because of reduced concentrations of chemical contaminants there, and these young may then be moving to repopulate western and central Lake Erie. Finally, there is greater awareness and appreciation of the species among the general public and additional protection for it under Ontario's *Endangered Species Act*.

A number of factors have contributed to the fragile repopulation of the Bald Eagle on Lake Erie

The U.S. side of Lake Erie

Active nests have been found in Ohio along the western end of the lake, roughly between Toledo and Sandusky Bay, and one was also observed around 1990 in Michigan. In 1991, there were 19 nesting pairs, up from 6 in 1985.

Canapress

Adult Bald Eagle

The rate of survival of young produced varies considerably. In 1990, 10 young fledged from 14 young that hatched; in 1991, only 4 of 12 young fledged. State wildlife staff are cautious about the future of the Bald Eagle in Ohio. Most of the new pairs are young birds, three to five years old. Wildlife staff fear that these birds may breed successfully for a few years but then show signs of repeated breeding failure, as has happened on Lake Michigan. However, it is possible that the lower levels of chemical contaminants in biota from Lake Erie, compared with Lake Michigan, will allow the eagles from Lake Erie to maintain their successful breeding for a longer period.

Disquieting signs

The Lake Erie release program has enabled a natural population of Bald Eagles to begin regenerating. Nonetheless, based on the situation in some other parts of the Great Lakes basin, the program's success must be viewed with guarded optimism. The species still has not begun to nest along the shore of Lake Ontario. Further, although it has begun to nest successfully along the shores of Lake Michigan and Lake Erie, the birds do so for only three to five years before productivity decreases. It may be that after that time, chemical contaminants build up to levels that inhibit reproduction. Still, successful reproduction for a three-year period before a return to reproductive failure is at least a modest achievement.

In spring 1993, three eaglets with crossed bill deformities were discovered in the state of Michigan: two on Lake Erie and one on Lake Michigan. These are three of ten deformities now known in the Great Lakes basin; nine have been found in nests at the shoreline. The deformities may reflect the continuing presence of and exposure to toxic chemicals in the Lake Erie basin. Although levels of major contaminants have decreased enough for eagles to reestablish territories, concentrations of PCBs and other contaminants that may cause deformities are apparently still too high. The cause-and-effect linkages between contaminant levels and specific visible deformities are the focus of current investigations.

The recovery process typically is a continuum along which there are both partial successes and partial failures

Taken together, these observations intimate that the Great Lakes basin aquatic ecosystem still requires much challenging cleanup work. Indeed, it would seem overly optimistic to expect that in one fell swoop, the ecosystem would go from being unable to support any nesting eagles to supporting populations similar to those of 50 years ago. The recovery process typically is

J. Robinson, Canadian Wildlife Service

Young Bald Eagle

a continuum along which there are both partial successes and partial failures. As the ecosystem becomes progressively cleaner, however, it is anticipated that future generations of Bald Eagles returning to southern Ontario will be able to breed successfully throughout the duration of their normal reproductive years.

A final word

This has been the story of the Bald Eagle on Lake Erie, from its dramatic decline in the middle part of this century to its reintroduction on Long Point in the mid-1980s. The slow recovery of the species in the Lake Erie basin is a painful reminder that it is much easier to damage an ecosystem than to mend it. Nonetheless, we are making progress, and perhaps one day many eagles will nest and raise their young along Lake Erie's shore.

For further reading

Broley, M.J. 1952. Eagle man. New York: Pellegrini and Cudahy.

Broley, M.J. 1958. Plight of the American Bald Eagle. Audubon Magazine 60:162–171.

Brown, L. 1977. Eagles of the world. New York: Universe Books.

Brown, L. and D. Amadon. 1968. Eagles, hawks, and falcons of the world. 2 vols. New York: McGraw-Hill Book Co.

Brownell, V.R. and M.J. Oldham. 1985. Status report on the Bald Eagle (*Haliaeetus leucocephalus*) in Canada. Ottawa: Committee on the Status of Endangered Wildlife in Canada.

Canadian Wildlife Service. 1992. Bald Eagle. Hinterland Who's Who. Ottawa: Environment Canada, Canadian Wildlife Service.

Gilbertson, M. (ed.). 1992. Proceedings of the Third Expert Consultation Meeting on Bald Eagles in the Great Lakes Basin. Windsor, Ontario: International Joint Commission.

Hunter, P., D. Baird, and M. Field. 1991. Bald Eagles in southwestern Ontario. Resources Report. Aylmer, Ontario: Ontario Ministry of Natural Resources, Aylmer District.

Hunter, P., D. Baird, W. Murch, and M. Field. 1993. Bald Eagles in southwestern Ontario. Resources Report. Aylmer, Ontario: Ontario Ministry of Natural Resources, Aylmer District.

McIlwraith, T. 1894. Birds of Ontario. 2nd ed. Toronto: William Briggs.

Metcalfe, W.H. 1987. Eagles across the border: Canada helping to restore the American national emblem. Canadian Geographic 107(5):20–26.

Stalmaster, M.V. 1987. The Bald Eagle. New York: Universe Books.

Wiemeyer, S.N., T.G. Lamont, C.M. Bunck, C.R. Sindelar, F.J. Gramlich, J.D. Fraser, and M.A. Byrd. 1984. Organochlorine pesticides, polychlorobiphenyl, and mercury residues in Bald Eagle eggs, 1969–1979, and their relationship to shell thinning and reproduction. Archives of Environmental Contamination and Toxicology 13:529–549.

For further information

Supplementary information on Bald Eagle rehabilitation in Ontario may be obtained from the following addresses:

Canadian Wildlife Service
Environment Canada, Ontario Region
25 St. Clair Avenue East, 6th Floor
Toronto, Ontario
M4T 1M2

Ontario Ministry of Natural Resources
Aylmer District
353 Talbot Street West
Aylmer, Ontario
N5H 2S8

Information on State of the Environment Reporting may be obtained from the following address:

State of the Environment Reporting
Environment Canada
Emerald Plaza, 4th Floor
Ottawa, Ontario
K1A 0H3

Authors: Linda McKeane and D.V. Weseloh

State of the Environment Reporting encourages "environmental citizenship" — a commitment to learn about the environment and engage in environmentally responsible activities at a personal level, within organizations, and within communities.

Published by Authority of the Minister of the Environment

Catalogue No. En1-12/93-3E
ISBN 0-662-20927-3

Également disponible en français sous le titre :
La réintroduction du Pygargue à tête blanche au lac Érié

Canada